

CLAIMS:

1. A device using magnetic force to actively aid a rotational movement of a shaft member attached to the device, the device comprising:

5 a male component having a first magnetic component, wherein the first magnetic component is arranged in a tapering spiral and presents a first magnetic pole of a particular orientation; and

10 a female component having a second magnetic component, wherein the second magnetic component is arranged substantially circumferentially around at least a portion of the male component and presents a second magnetic pole of the same particular orientation, such that the first magnetic component and the second magnetic component magnetically interact so as to both repel and turn, thereby actively aiding the rotational movement of the attached shaft member.

15 2. The device as set forth in claim 1, wherein the male component further includes a conical body and the first magnetic component is wrapped spirally about the conical body.

20 3. The device as set forth in claim 1, wherein the first magnetic component and the second magnetic component are constructed of substantially permanently magnetized neodymium boron carbon.

25 4. The device as set forth in claim 1, wherein the first magnetic component includes a first plurality of adjacently arranged individual magnets, and the second magnetic component includes a second plurality of adjacently arranged individual magnets.

30 5. The device as set forth in claim 1, wherein the first magnetic component includes a single length of a flexible magnetic material.

6. The device as set forth in claim 1, wherein the female component further includes a conical recess operable to receive at least a portion of the male component, and about which is arranged the second magnetic component.

5 7. The device as set forth in claim 1, wherein the second magnetic component further includes -

a lower circumferential row of magnetic material;  
a central circumferential row of magnetic material; and  
an upper circumferential row of magnetic material.

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8. A device using magnetic force to actively aid a rotational movement of a shaft member attached to the device, the device comprising:

a male component including -

a conical body, and

a first magnetic component wrapped spirally about the conical body  
and presenting a first magnetic pole of a particular orientation;  
and

a female component including a second magnetic component arranged  
substantially circumferentially around at least a portion of the male  
component and presenting a second magnetic pole of the same  
particular orientation, such that the first magnetic component and the  
second magnetic component magnetically interact so as to both repel  
and turn, thereby actively aiding the rotational movement of the  
attached shaft member.

9. The device as set forth in claim 8, wherein the first magnetic component and the second magnetic component are constructed of substantially permanently magnetized neodymium boron carbon.

10. The device as set forth in claim 8, wherein the first magnetic component includes a first plurality of adjacently arranged individual magnets, and the second magnetic component includes a second plurality of adjacently arranged individual magnets.

11. The device as set forth in claim 8, wherein the first magnetic component includes a single length of a flexible magnetic material.

12. The device as set forth in claim 8, wherein the female component further includes a conical recess operable to receive at least a portion of the male component, and about which is arranged the second magnetic component.

13. The device as set forth in claim 8, wherein the second magnetic component further includes -

- a lower circumferential row of magnetic material;
- a central circumferential row of magnetic material; and
- an upper circumferential row of magnetic material.

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14. A device using magnetic force to actively aid a rotational movement of a shaft member attached to the device, the device comprising:

a male component including -

a conical body, and

a first magnetic component wrapped spirally about the conical body and presenting a first magnetic pole of a particular orientation; and

a female component including -

a conical recess operable to receive at least a portion of the male component, and

a second magnetic component arranged about the conical recess and including -

a lower circumferential row of magnetic material,

a central circumferential row of magnetic material, and

an upper circumferential row of magnetic material,

wherein the second magnetic component is arranged substantially circumferentially around at least a portion of the male component and the second magnetic component presents a second magnetic pole of the same particular orientation, such that the first magnetic component and the second magnetic component magnetically interact so as to both repel and turn, thereby actively aiding the rotational movement of the attached shaft member.

15. The device as set forth in claim 14, wherein the first magnetic component and the second magnetic component are constructed of substantially permanently magnetized neodymium boron carbon.

16. The device as set forth in claim 14, wherein the first magnetic component includes a first plurality of adjacently arranged individual magnets, and the second magnetic component includes a second plurality of adjacently arranged individual magnets.

17. The device as set forth in claim 14, wherein the first magnetic component includes a single length of a flexible magnetic material.

18. The device as set forth in claim 14, wherein the lower row includes a first single length of a flexible magnetic material, the central row includes a second single length of the flexible magnetic material, and the upper row includes a third single length of the flexible magnetic material.

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